Equine blink rate, reactivity and learning: can one predict the other?

Rachel Clarke (MSc, BSc (hons), PGCE)
Myerscough College University Centre
Preston
UK
Conducted at Royal Agricultural University, Cirencester, UK 2011-2012

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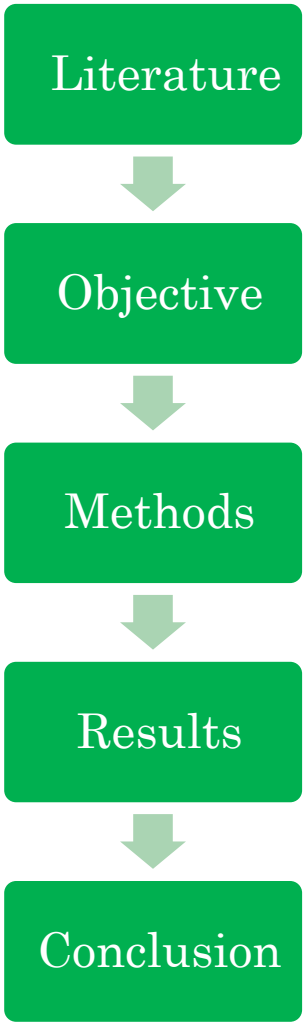
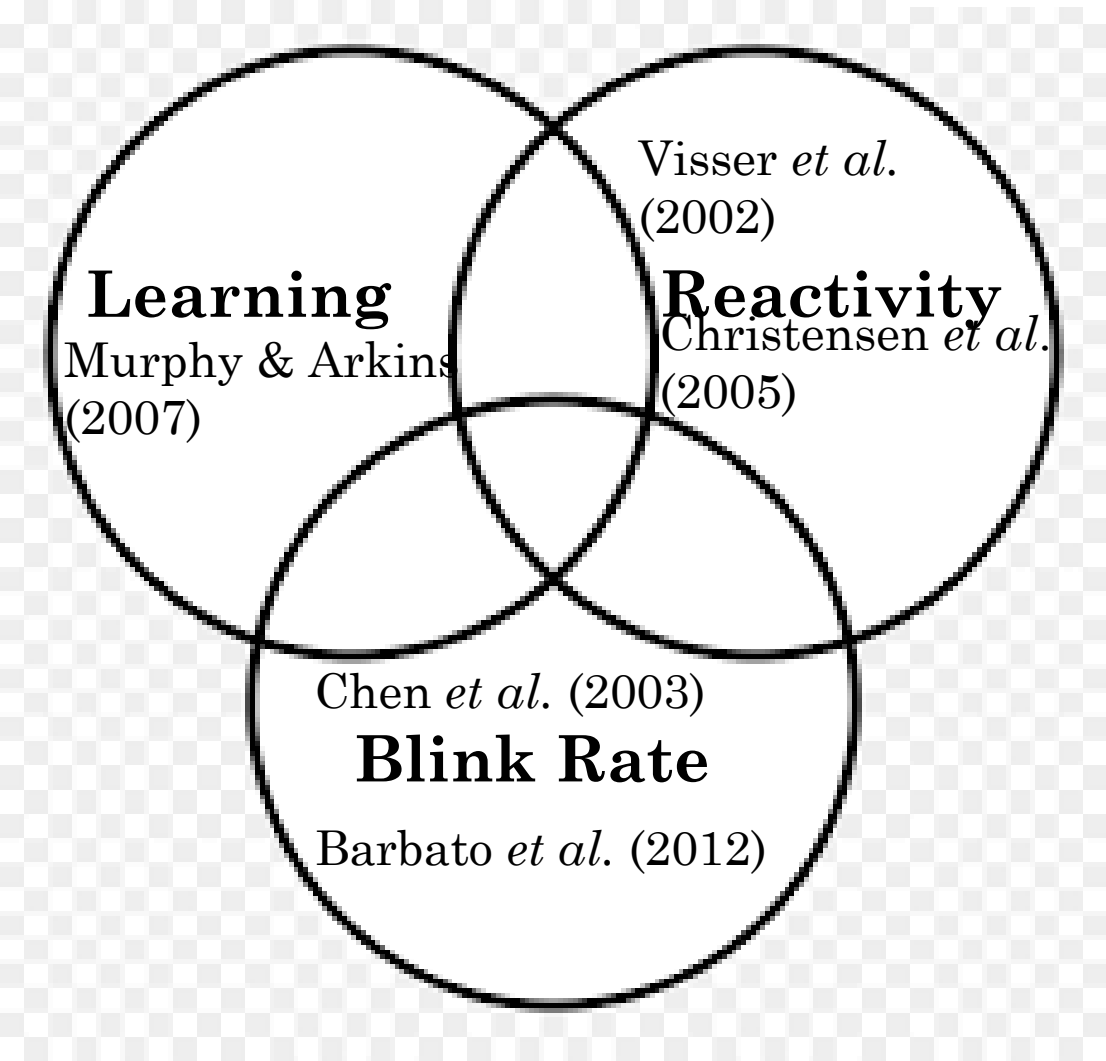
Agenda



Literature


Visser *et al.* (2002)
Learning
Murphy & Arkins (2007)
Reactivity
Christensen *et al.* (2005)
Chen *et al.* (2003)
Blink Rate
Barbato *et al.* (2012)

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Objective

- Investigate possible links between dopamine release in the brain via blink rate measurement, equine reactivity and learning

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Methodology

- Subjects
  - N=20, Age=14yrs±1.2; Height=146.375cm±2.103
- Blink Rate
  - Full eye blink rates in the left eye for 10minutes

METHODOLOGY

- Novel object test
  - 3 separate novel object tests (Fig 1-4)

Figure 1: Novel object test set up

Figure 2: Novel object 1

Figure 3: Novel object 2

Figure 4: Novel object 3

Methodology

- Reversal Discrimination Task
  - Two stimulus cards of black 2D shapes on laminated white card (Fig 5-6)
  - The number of 10 consecutive reversed correct responses were measured

Figures 5&6: Reversal Discrimination Task Cards

Results: Learning, reactivity & dopamine release

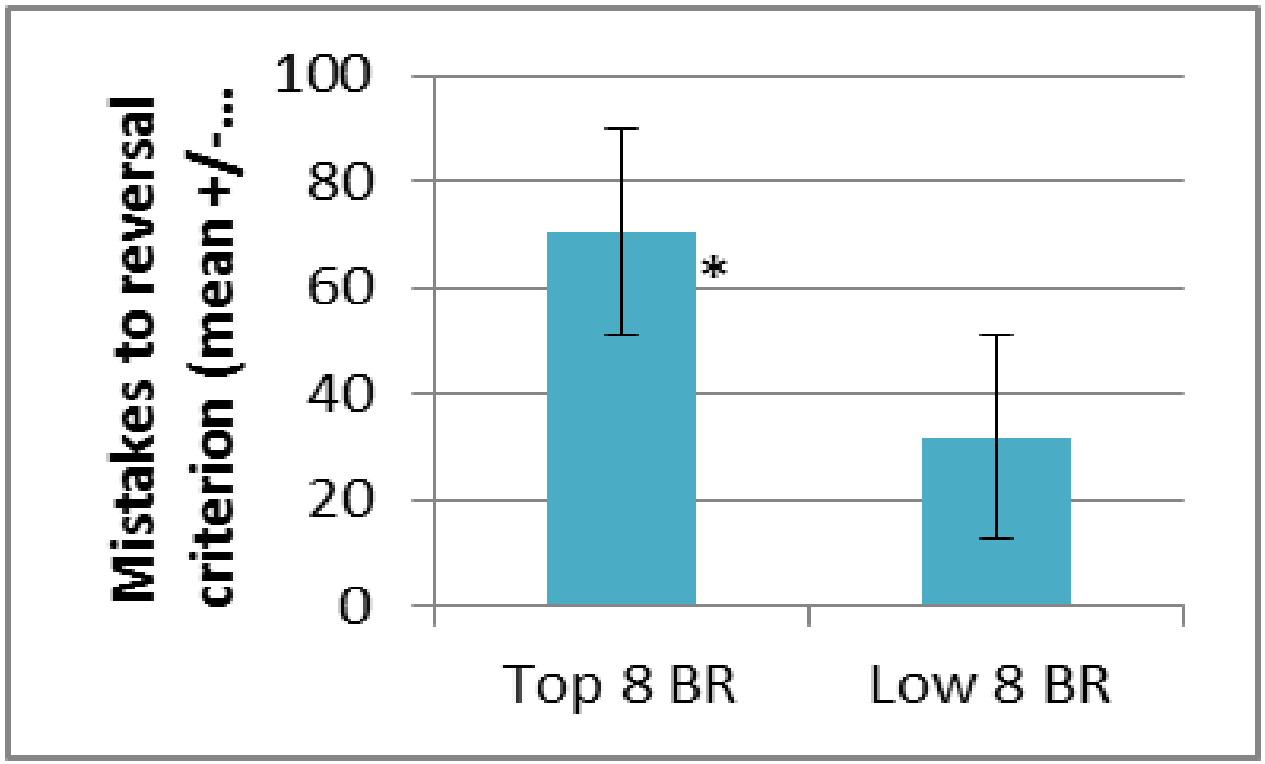

Fig 7: Mistakes made by the high versus low blink rate groups (*=0.05) (U=10, P<0.05)

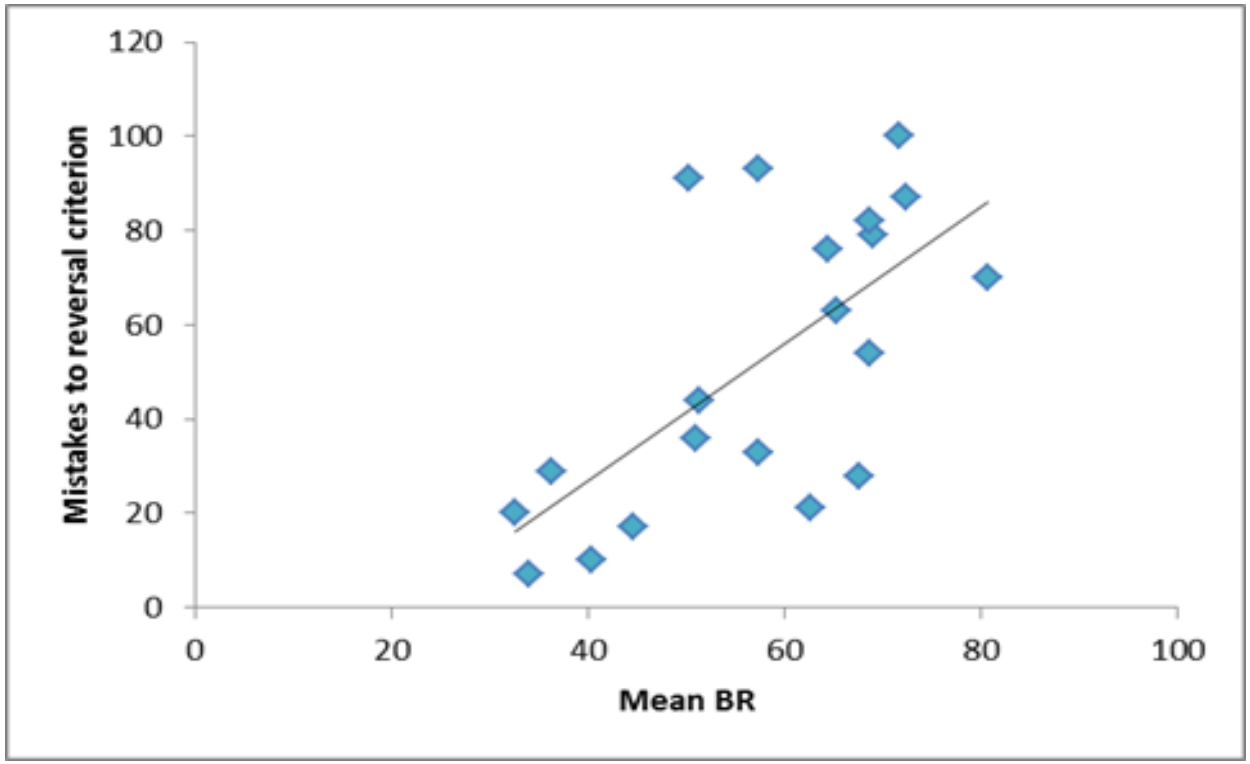

Fig 10: The relationship between mean blink rate and mistakes to reversal criterion. (R^2=0.44, P<0.05)

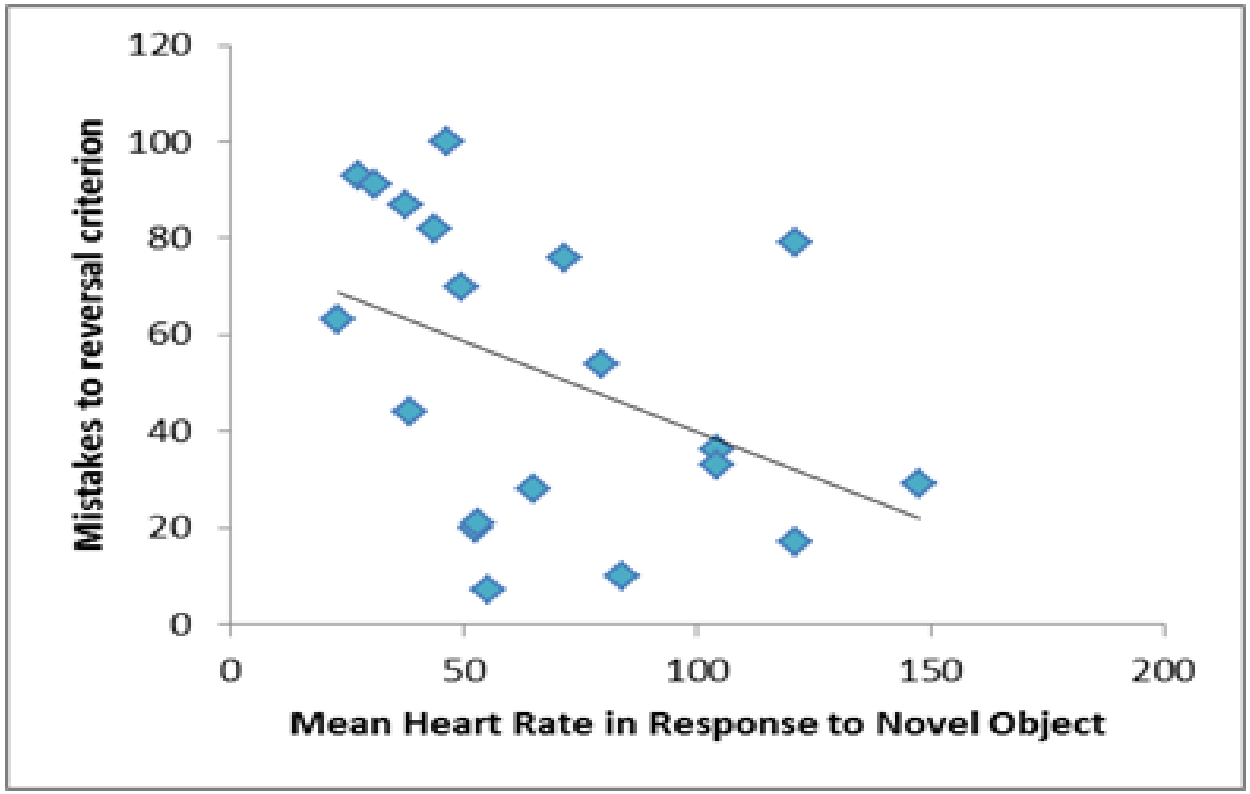

Fig 9: The relationship between response to the novel object and mistakes to reversal criterion. (R^2=0.19, P=0.056)

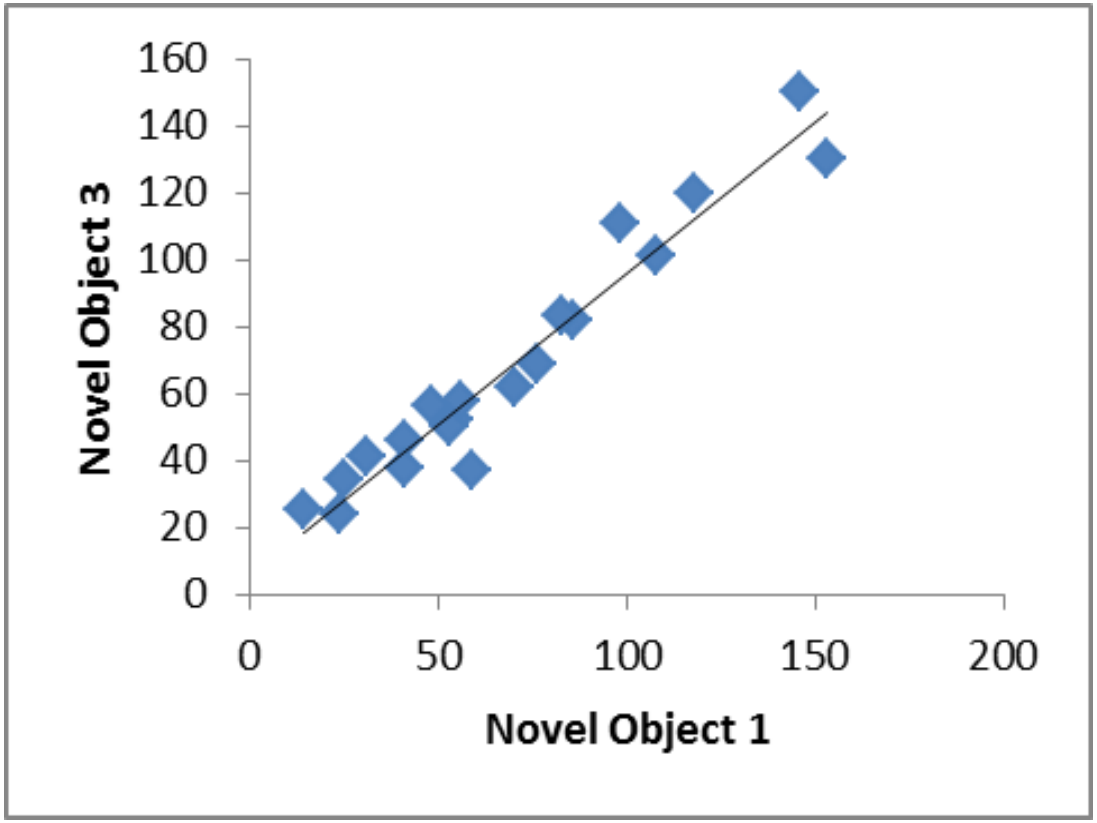

Fig 8: Relationship between heart rate responses to novel object 1 versus novel object 3. (R^2=0.04, P<0.001)

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CONCLUSION

- Link between dopamine release and the level of learning ability
- Link between learning ability and reactivity responses

- Suggest that if one of these traits is known the ability to predict the other is now available
- Allow better tailored training programmes

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